1. A servo writer for generating a linear servo track timing based servo pattern in a linear direction on a linear data storage medium, said timing based servo pattern comprised of a repeating cyclic periodic sequence of transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said linear data storage medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said transitions having different azimuthal orientation as compared to time between two said transitions having parallel azimuthal orientation, said generator comprising:

at least three spaced apart write elements, two said write elements of parallel azimuthal orientation, and at least one said write element of a different azimuthal orientation than said two write elements of parallel azimuthal orientation;

a drive for moving said linear data storage medium in said linear direction across said write elements; and

a source of timed pulses coupled to said write elements and providing timed pulses to cause said spaced apart write elements to simultaneously write, thereby writing patterns of transitions on said linear data storage medium corresponding to said spaced apart write elements as said drive moves said linear data storage medium across said write elements, whereby said spaced apart

write elements fix a distance between said simultaneously written transitions having different azimuthal orientation and fix a distance between said simultaneously written transitions having parallel azimuthal orientation.

2. The servo writer of Claim **1**, wherein at least one said write element of said different azimuthal orientation is located intermediate said two write elements of parallel azimuthal orientation.

3. The servo writer of Claim **1**, wherein said linear data storage medium comprises a magnetic tape, and wherein said at least three spaced apart write elements each comprises a magnetic write gap arranged to provide a magnetic signal in response to said timed pulse, said magnetic signal writing a magnetic transition on said magnetic tape.

4. A servo writer for generating a linear servo track timing based servo pattern in a linear direction on a linear data storage medium, said timing based servo pattern comprised of a repeating cyclic periodic sequence of transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said linear data storage medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said transitions having different azimuthal orientation as compared to time between two said transitions having parallel azimuthal orientation, said generator comprising:

at least three spaced apart write elements, two said write elements of parallel azimuthal orientation, and at least one said write element of a different azimuthal orientation than said two write elements of parallel azimuthal orientation;

a drive for moving said linear data storage medium in said linear direction across said write elements; and

a source of timed pulses coupled to said write elements and providing timed pulses to cause said spaced apart write elements to simultaneously write, thereby writing patterns of transitions on said linear data storage medium corresponding to said spaced apart write elements as said drive moves said linear data storage medium across said write elements, whereby said spaced apart

write elements fix a distance between said simultaneously written transitions having different azimuthal orientation and fix a distance between said simultaneously written transitions having parallel azimuthal orientation, wherein said source of timed pulses provides sets of pulses to said write elements, each said set of pulses writing a pattern of said transitions, and spaces said sets of pulses to prevent overwriting of one said pattern of transitions by another.

5. The servo writer of Claim **4**, wherein at least one said write element of said different azimuthal orientation is located intermediate said two write elements of parallel azimuthal orientation; and wherein said source of timed pulses additionally spaces said sets of pulses such that, in said repeating cyclic periodic sequence of transitions, said transitions having parallel azimuthal orientation at one end of one pattern continue with said transitions having parallel azimuthal orientation at the opposite end of the next pattern, such that said continuing transitions having parallel azimuthal orientation of said one pattern and said next pattern are combined to have a different number of transitions than the remainder of said repeating cyclic periodic sequence of transitions, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

6. The servo writer of Claim **4**, comprising an even number of said write elements, and wherein said source of timed pulses provides a different number of said pulses for alternating said sets of pulses provided to said write elements, whereby said sets of pulses write alternating said patterns with different numbers of said transitions, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

7. The servo writer of Claim **4**, wherein said source of timed pulses is coupled to at least two adjacent said write elements and separately coupled to other said write elements, said source of timed pulses providing first timed pulses to all of said spaced apart write elements to simultaneously write to fix said distances between said transitions, and additionally providing at least one second timed pulse to less than all and at least said two adjacent write elements to provide a different number of said pulses for said at least two adjacent write elements to thereby write different numbers of said transitions within said pattern, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

8. A method for generating a linear servo track timing based servo pattern in a linear direction on a linear data storage medium, said timing based servo pattern comprised of a repeating cyclic periodic sequence of transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said linear data storage medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said transitions having different azimuthal orientation as compared to time between two said transitions having parallel azimuthal orientation, comprising the steps of:

providing at least three spaced apart write elements, two said write elements of parallel azimuthal orientation, and at least one said write element of a different azimuthal orientation than said two write elements of parallel azimuthal orientation;

moving said linear data storage medium in said linear direction across said write elements; and

providing timed pulses to cause said spaced apart write elements to simultaneously write, thereby writing patterns of transitions on said linear data storage medium corresponding to said spaced apart write elements as said linear data storage medium is moved across said write elements, whereby said spaced apart write elements fix a distance between said simultaneously

written transitions having different azimuthal orientation and fix a distance between said simultaneously written transitions having parallel azimuthal orientation.

9. The method of Claim **8**, wherein said step of providing at least three spaced apart write elements additionally comprises locating at least one said write element of said different azimuthal orientation intermediate said two write elements of parallel azimuthal orientation.

10. The method of Claim **8**, wherein said linear data storage medium comprises a magnetic tape, and wherein said step of providing at least three spaced apart write elements, comprises providing at least three spaced apart magnetic write gaps arranged to provide a magnetic signal in response to said provided timed pulse, said magnetic signal writing a magnetic transition on said magnetic tape.

11. A method for generating a linear servo track timing based servo pattern in a linear direction on a linear data storage medium, said timing based servo pattern comprised of a repeating cyclic periodic sequence of transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said linear data storage medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said transitions having different azimuthal orientation as compared to time between two said transitions having parallel azimuthal orientation, comprising the steps of:

providing at least three spaced apart write elements, two said write elements of parallel azimuthal orientation, and at least one said write element of a different azimuthal orientation than said two write elements of parallel azimuthal orientation;

moving said linear data storage medium in said linear direction across said write elements; and

providing timed pulses to cause said spaced apart write elements to simultaneously write, thereby writing patterns of transitions on said linear data storage medium corresponding to said spaced apart write elements as said linear data storage medium is moved across said write elements, whereby said spaced apart write elements fix a distance between said simultaneously

written transitions having different azimuthal orientation and fix a distance between said simultaneously written transitions having parallel azimuthal orientation, wherein said step of providing timed pulses comprises providing sets of pulses to said write elements, each said set of pulses writing a pattern of said transitions, and spaces said sets of pulses to prevent overwriting of one said pattern of transitions by another.

12. The method of Claim **11**, wherein said step of providing at least three spaced apart write elements, additionally comprises locating at least one said write element of said different azimuthal orientation intermediate said two write elements of parallel azimuthal orientation; and wherein said step of providing timed pulses additionally comprises spacing said sets of pulses such that in said repeating cyclic periodic sequence of transitions, said transitions having parallel azimuthal orientation at one end of one pattern continue with said transitions having parallel azimuthal orientation at the opposite end of the next pattern, such that said continuing transitions having parallel azimuthal orientation of said one pattern and said next pattern are combined to have a different number of transitions than the remainder of said repeating cyclic periodic sequence of transitions, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

13. The method of Claim **11**, wherein said step of providing at least three spaced apart write elements comprises providing an even number of said write elements, and wherein said step of providing timed pulses comprises providing a different number of said pulses for alternating said sets of pulses provided to said write elements, whereby said sets of pulses write alternating said patterns with different numbers of said transitions, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

14. The method of Claim **11**, wherein said step of providing timed pulses comprises providing first timed pulses to all of said spaced apart write elements to simultaneously write to fix said distances between said transitions, and additionally providing at least one second timed pulse to less than all and at least two adjacent said write elements to provide a different number of said pulses for said at least two adjacent write elements to thereby write different numbers of said transitions within said pattern, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

15. A sensible transition pattern for recording servo information in a linear direction on a linear data storage medium defining at least one linear servo track, said sensible transition pattern comprised of a timing based servo pattern of a repeating cyclic periodic sequence of transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said linear data storage medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said transitions having different azimuthal orientation as compared to time between two said transitions having parallel azimuthal orientation, comprising:

a repeating pattern of at least three spaced apart said transitions of said two different azimuthal orientations that extend laterally of said linear servo track, two of said transitions of parallel azimuthal orientation, and at least one of said transitions of a different azimuthal orientation than said two transitions of parallel azimuthal orientation; said at least three spaced apart said transitions simultaneously written to fix a distance between said simultaneously written transitions having different azimuthal orientation and to fix a distance between said simultaneously written transitions having parallel azimuthal orientation, thereby defining a distance between said

simultaneously written transitions having different azimuthal orientation and said distance between transitions having parallel azimuthal orientation.

16. The sensible transition pattern of Claim **15**, wherein at least one said transition of said different azimuthal orientation is located intermediate said two transitions of parallel azimuthal orientation, in said repeating pattern of at least three spaced apart said transitions.

17. The sensible transition pattern of Claim **15**, wherein said linear data storage medium comprises a magnetic tape, and wherein said at least three spaced apart said transitions each comprises a magnetic transition on said magnetic tape.

18. A sensible transition pattern for recording servo information in a linear direction on a linear data storage medium defining at least one linear servo track, said sensible transition pattern comprised of a timing based servo pattern of a repeating cyclic periodic sequence of transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said linear data storage medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said transitions having different azimuthal orientation as compared to time between two said transitions having parallel azimuthal orientation, comprising:

a repeating pattern of at least three spaced apart said transitions of said two different azimuthal orientations that extend laterally of said linear servo track, two of said transitions of parallel azimuthal orientation, and at least one of said transitions of a different azimuthal orientation than said two transitions of parallel azimuthal orientation; said at least three spaced apart said transitions simultaneously written to fix a distance between said simultaneously written transitions having different azimuthal orientation and to fix a distance between said simultaneously written transitions having parallel azimuthal orientation, thereby defining said distance between

transitions having different azimuthal orientation and said distance between transitions having parallel azimuthal orientation, wherein said transitions are arranged in sets of transitions, forming said repeating pattern, said sets of transitions spaced to prevent overwritten transitions of one said repeating pattern by another.

19. The sensible transition pattern of Claim **18**, wherein said repeating pattern of at least three spaced apart said transitions comprises at least one said transition of said different azimuthal orientation located intermediate said two transitions of parallel azimuthal orientation; and wherein said sets of transitions are additionally spaced such that in said repeating cyclic periodic sequence of transitions, said transitions having parallel azimuthal orientation at one end of one said repeating pattern continue with said transitions having parallel azimuthal orientation at the opposite end of the next said repeating pattern, such that said continuing transitions having parallel azimuthal orientation of said one repeating pattern and said next repeating pattern are combined to have a different number of transitions than the remainder of said repeating cyclic periodic sequence of transitions, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

20. The sensible transition pattern of Claim **18**, wherein said repeating pattern of at least three spaced apart said transitions comprises an even number of said transitions, and wherein alternating said sets of said transitions of said repeating patterns comprise different numbers of said transitions, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

21. The sensible transition pattern of Claim **18**, wherein said at least three spaced apart simultaneously written transitions, written to fix said distance between transitions having different azimuthal orientation and to fix said distance between transitions having parallel azimuthal orientation, are accompanied by additional separately written second spaced apart transitions fewer in number than said at least three simultaneously written transitions, written to provide different numbers of said transitions within said pattern, thereby providing synchronization of said repeating cyclic periodic sequence of transitions.

22. A magnetic tape medium having prerecorded servo information recorded in a linear direction in magnetic transition patterns defining at least one linear servo track, said magnetic transition pattern comprised of a timing based servo pattern of a repeating cyclic periodic sequence of magnetic transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said magnetic tape medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said magnetic transitions having different azimuthal orientation as compared to time between two said magnetic transitions having parallel azimuthal orientation, comprising:

a repeating pattern of at least three spaced apart said magnetic transitions of said two different azimuthal orientations that extend laterally of said linear servo track, two of said magnetic transitions of parallel azimuthal orientation, and at least one of said magnetic transitions of a different azimuthal orientation than said two magnetic transitions of parallel azimuthal orientation; said at least three spaced apart said magnetic transitions simultaneously written to fix a distance between said simultaneously written magnetic transitions having different azimuthal orientation and to fix a distance between said simultaneously written magnetic transitions having parallel

azimuthal orientation, thereby defining said distance between magnetic transitions having different azimuthal orientation and said distance between magnetic transitions having parallel azimuthal orientation.

23. The magnetic tape medium of Claim **22**, wherein at least one said magnetic transition of said different azimuthal orientation is located intermediate said two magnetic transitions of parallel azimuthal orientation, in said repeating pattern of at least three spaced apart said magnetic transitions.

24. A magnetic tape medium having prerecorded servo information recorded in a linear direction in magnetic transition patterns defining at least one linear servo track, said magnetic transition pattern comprised of a timing based servo pattern of a repeating cyclic periodic sequence of magnetic transitions of two different azimuthal orientations that extend laterally of said linear servo track, said timing based servo track sensed during movement of said magnetic tape medium in said linear direction by determining lateral positioning with respect to said linear servo track based on a measure of time between two said magnetic transitions having different azimuthal orientation as compared to time between two said magnetic transitions having parallel azimuthal orientation, comprising:

a repeating pattern of at least three spaced apart said magnetic transitions of said two different azimuthal orientations that extend laterally of said linear servo track, two of said magnetic transitions of parallel azimuthal orientation, and at least one of said magnetic transitions of a different azimuthal orientation than said two magnetic transitions of parallel azimuthal orientation; said at least three spaced apart said magnetic transitions simultaneously written to fix a distance between said simultaneously written magnetic transitions having different azimuthal orientation and to fix a distance between said simultaneously written magnetic transitions having parallel

azimuthal orientation, thereby defining said distance between magnetic transitions having different azimuthal orientation and said distance between magnetic transitions having parallel azimuthal orientation, wherein said magnetic transitions are arranged in sets of magnetic transitions, forming said repeating pattern, said sets of magnetic transitions spaced to prevent overwritten magnetic transitions of one said repeating pattern by another.

25. The magnetic tape medium of Claim **24**, wherein said repeating pattern of at least three spaced apart said magnetic transitions comprises at least one said magnetic transition of said different azimuthal orientation located intermediate said two magnetic transitions of parallel azimuthal orientation; and wherein said sets of magnetic transitions are additionally spaced such that in said repeating cyclic periodic sequence of magnetic transitions, said magnetic transitions having parallel azimuthal orientation at one end of one said repeating pattern continue with said magnetic transitions having parallel azimuthal orientation at the opposite end of the next said repeating pattern, such that said continuing magnetic transitions having parallel azimuthal orientation of said one repeating pattern and said next repeating pattern are combined to have a different number of magnetic transitions than the remainder of said repeating cyclic periodic

sequence of magnetic transitions, thereby providing synchronization of said repeating cyclic periodic sequence of magnetic transitions.

26. The magnetic tape medium of Claim **24**, wherein said repeating pattern of at least three spaced apart said magnetic transitions comprises an even number of said magnetic transitions, and wherein alternating said sets of said magnetic transitions of said repeating patterns comprise different numbers of said magnetic transitions, thereby providing synchronization of said repeating cyclic periodic sequence of magnetic transitions.

27. The magnetic tape medium of Claim **24**, wherein said at least three spaced apart simultaneously written magnetic transitions, written to fix said distance between magnetic transitions having different azimuthal orientation and to fix said distance between magnetic transitions having parallel azimuthal orientation, are accompanied by additional separately written second spaced apart magnetic transitions fewer in number than said at least three simultaneously written magnetic transitions, written to provide different numbers of said magnetic transitions within said pattern, thereby providing synchronization of said repeating cyclic periodic sequence of magnetic transitions.